

AMENDMENT TO THE CLAIMS

1. (Currently amended) An apparatus for facilitating transdermal delivery of therapeutic substances, said apparatus comprising:

an electromagnetic field generating device including a coil which has electrical connectivity at both ends to allow unidirectional flow of current;

a control device arranged to control said field generating device to alternately produce active and substantially inactive electromagnetic field portions, each said active electromagnetic field portion ~~including an electromagnetic field packet having~~ having a frequency of between 10Hz and 100Hz and comprising a plurality of generally rectangular electromagnetic field pulses having wherein each electromagnetic field pulse has a duration of between 25 μ s and 100ms ~~delivered at a frequency of between 1Hz and 100Hz~~, each said substantially inactive electromagnetic field portion including no electromagnetic field pulses, wherein the duration of the inactive electromagnetic field portion is longer than the duration of the active electromagnetic field packet portion.

2. (Previously presented) Apparatus as claimed in claim 1, wherein the electromagnetic field generating device comprises a solid state switching device.

3. (Currently Amended) Apparatus as claimed in claim 2, wherein the control device is arranged to produce an energisation signal useable to control switching of the solid state switching device to produce active and substantially inactive energisation signal portions, each ~~energisation signal packet including an~~ active energisation signal portion including a plurality of energisation signal pulses and a substantially inactive energisation signal portion including no energisation signal pulses, and wherein the active energisation signal portion produces the active electromagnetic field portion and the inactive energisation signal portion produces the inactive electromagnetic field portion.

4-5. Canceled.

6. (Previously presented) Apparatus as claimed in claim 2, wherein the solid state switching device comprises a transistor.

7. (Previously presented) Apparatus as claimed in claim 1, wherein the control device comprises a microcontroller.

8. (Original) Apparatus as claimed in claim 7, wherein the microcontroller is programmable by a user so that an electromagnetic signal corresponding to a predetermined therapeutic substance delivery plan is produced.

9. (Original) Apparatus as claimed in claim 8, wherein the microcontroller is programmed such that dermal permeability is increased at one or more specific times.

10. (Previously presented) Apparatus as claimed in claim 8, wherein the microcontroller is programmed such that dermal permeability is increased for a specific period of time.

11. Canceled.

12. (Currently amended) Apparatus as claimed in claim 43, wherein the active energisation signal ~~packet~~ portion repeats at a frequency of between 10Hz and 50Hz.

13. (Currently amended) Apparatus as claimed in claim 3, wherein each active energisation signal ~~packet~~ portion includes between 12 and 20 energisation signal pulses.

14-15. Canceled.

16. (Previously presented) Apparatus as claimed in claim 1, wherein the apparatus comprises a substantially flat member having the electromagnetic field generating device and the control device embedded therein.

17. (Previously presented) Apparatus as claimed in claim 1, wherein the therapeutic substance is disposed on an outwardly facing surface of the apparatus.

18. (Previously presented) Apparatus as claimed in claim 1, wherein the therapeutic substance is a drug, vaccine, ion, macromolecule, DNA fragment or gene.

19. (Currently amended) A method of transdermally delivering therapeutic substances, said method comprising:

producing an electromagnetic field using a coil which has electrical connectivity at both ends to allow unidirectional flow of current;

directing the electromagnetic field at a desired treatment area of a patient's skin;
and

controlling the electromagnetic field so as to alternately produce active and substantially inactive electromagnetic field portions, each said active electromagnetic field portion ~~including an electromagnetic field packet having~~ having a frequency of between 10Hz and 100Hz and comprising a plurality of successive generally rectangular electromagnetic field pulses ~~having wherein each electromagnetic field pulse has~~ a duration of between 25 μ s and 100ms, ~~a frequency of between 1Hz and 100Hz, and a generally rectangular configuration,~~ each said substantially inactive electromagnetic field portion including no electromagnetic field pulses, wherein the duration of the inactive electromagnetic field portion is longer than the duration of the active electromagnetic field ~~packet~~ portion.

20. (Currently amended) A method as claimed in claim 19, wherein the step of controlling the electromagnetic field comprises producing an energisation signal useable to control switching of a solid state switching device to produce active and substantially inactive energisation signal portions, each energisation signal ~~packet~~ portion including an active energisation signal portion including a plurality of energisation signal pulses and a substantially inactive energisation signal portion including no energisation signal pulses and wherein the active energisation signal portion produces the active electromagnetic field portion and the inactive energisation signal portion produces the inactive electromagnetic field portion.

21-22. Canceled.

23. (Previously presented) A method as claimed in claim 20, wherein the solid state switching device comprises a transistor.

24. (Previously presented) A method as claimed in claim 19, wherein the control means comprises a microcontroller.

25. (Original) A method as claimed in claim 24, further comprising the step of programming the microcontroller so that during use an electromagnetic signal corresponding to a predetermined therapeutic substance delivery plan is produced.

26. (Original) A method as claimed in claim 25, further comprising the step of programming the microcontroller such that dermal permeability is increased at one or more specific times.

27. (Previously presented) A method as claimed in claim 25, further comprising the step of programming the microcontroller such that dermal permeability is increased for a specific period of time.

28. Canceled.

29. (Currently amended) A method as claimed in claim ~~28~~19, wherein the active energisation signal ~~packet~~portion repeats at a frequency of between 10Hz and 50Hz.

30. (Currently amended) A method as claimed in claim 20, wherein each active energisation signal ~~packet~~portion includes between 12 and 20 energisation signal pulses.

31-32. Canceled.

33. (Previously presented) A method as claimed in claim 19, wherein the therapeutic substance is a drug, vaccine, ion, macromolecule, DNA fragment or gene.

34. (Currently amended) An apparatus for facilitating transdermal delivery of therapeutic substances, said apparatus comprising:

an electromagnetic field generating device including a solid state switching device coupled to a coil which has electrical connectivity at both ends to allow unidirectional flow of current, the solid state switching device being operative to energize the coil with direct current to selectively produce an electromagnetic field;

a control device coupled to the solid state switching device to control said field generating device to alternately produce active and substantially inactive electromagnetic field portions by selectively energizing the coil, each said active electromagnetic field portion ~~including an electromagnetic field packet having having a~~ frequency of between 10Hz and 100Hz and comprising a plurality of successive, generally rectangularly-shaped electromagnetic field pulses wherein each ~~electromagnetic field pulse has~~ having a duration of between 25 μ s and 100ms ~~and a~~ frequency of between 1Hz and 100Hz, each said substantially inactive electromagnetic field portion including no electromagnetic field pulses, wherein the duration of the inactive electromagnetic field portion is longer than the duration of the active electromagnetic field ~~packet~~ portion.

35. (Previously presented) The apparatus of claim 34, wherein the control device comprises a microcontroller programmable by a user so that an electromagnetic signal pattern corresponding to a predetermined therapeutic substance delivery plan is produced.

36. (Previously presented) The apparatus of claim 34, wherein the electromagnetic field pulses have an electromagnetic field strength of less than or equal to 3 Gauss and sufficient to facilitate transdermal delivery of therapeutic substances by increasing dermal permeability of a portion of the skin of a user of the apparatus.

37. (Previously presented) The apparatus of claim 1, wherein the control device includes control circuitry arranged to control said field generating device to alternately produce said active and said substantially inactive electromagnetic field portions by selectively energizing and de-energizing said field generating device while power is applied to said control circuitry.

38. (Previously presented) The apparatus of claim 1, wherein the electromagnetic field pulses have an electromagnetic field strength of less than or equal

to 3 Gauss and sufficient to facilitate transdermal delivery of therapeutic substances by increasing dermal permeability of a portion of the skin of a user of the apparatus.

39. (Previously presented) The method of claim 19, wherein the electromagnetic field pulses have an electromagnetic field strength of less than or equal to 3 Gauss and sufficient to facilitate transdermal delivery of therapeutic substances by increasing dermal permeability of the desired treatment area of the patient's skin.